

HUMAN EYE GADGET WITH NEW TECHNOLOGY

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ABSTRACT

A new technology using an augmented reality Head Mounted Display technique which combines the real world with virtual objects. The actual purpose behind the invention of this magical glass was to ease & hands-free display of the information & applications i.e. currently possible via the smart phones thereby along with the internet access to the varying users through simple natural voice commands. The glasses developed by Google engineers are simply wearable computers offering combined features of virtual reality & augmented reality which raises the present standard of living. It uses the same Android platform as its O.S. similar to that of many smart phones & tablets and is also equipped with the GPS & motion sensors technology. It will prove to be a powerful futuristic gadget loaded with high end technologies serving all kinds of peoples including handicapped ones.

KEYWORDS: Google Glass, Virtual Reality, Augmented Reality, project Glass, Glass Technology, Eye Tap, Smart Clothing, Android Glass

INTRODUCTION

Keeping various constraints being offered from the usage of today's smart phones and tablets that restricted their usage completely for the entire human society. So, there was a need of a new technology which could serve the desired help to the entire section of society with fruitful results. Google was working on these major issues which resulted in the development of this emerging wireless wearable technology. This technology is considered to be very fresh in comparison with the already existing ones thereby resulting in a dawn of new era which is completely controlled simply by human's vision and voice commands.

Google glass was invented in Google[X] lab, the R&D segment of the search giant where scientists are constantly working on sci-fi sounding technologies to solve some of the world's really big problems. It was announced on Google+ by project leader Mr. Babak Parviz, an Electrical engineer who also has worked on putting a display into the contact lenses. The design of Google Glass is like an Eyewear with an Optical Head Mounted Display (OHMD) [3]. This device is combination of camera, display, touchpad, battery & microphone which is built into a spectacle frames. With the Glasses a user can access the internet anywhere & anytime. Simply, they are seemed to be the futuristic gadget which allows users to record a video, take a picture, search any contents & thereby translate the contents-on the go. [7]

COMPANY'S VISION

The major goal in coming up with this high end user driven technology was to cope up the very pitfalls of the next generation gadgets serving human needs. Google had devised a plan in its early days to come up with a wearable device to pull off the very fresh technique of serving the varying user needs with the constant evolving time period. The glass was developed keeping certain parameters in mind which reduces its overall costs and improves its efficiency along with

effectiveness. The development of this magically powerful glass laid to the bridging of serving gap between the two different sections of human society comprising of both normal as well as abnormal ones.

With a team of highly experienced engineers from the desired domain covering wearable technology experts, researchers and freelancers, Google hired some new faces for the successful implementation of this technique along with a broader level of testing practically among the humans. In the result obtained, desired technologies were refined to improve the designing and materials used for the glasses development. Google developed specially crafted algorithms to evaluate the techniques used for detecting the navigation directions, data transmission speed along with high quality instant images or video clips to serve the varying users need quickly.

BASIC STRUCTURES AND COMPONENTS

Google Glass Structure

The Google Glasses has got the same look and feel like an ordinary glasses but it consist of a main system, audio speakers, built in camera & interacting screen

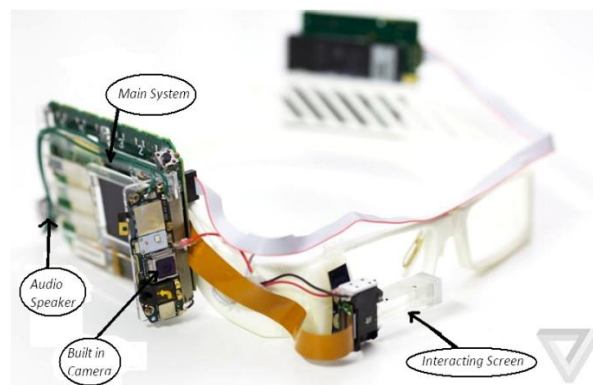


Figure 1: Structure of Google Glass

Google Glass Components

The numbers of components used in the development of Google Glass are enlisted below:

- A microprocessor,
- A memory chip,
- A battery, a speaker,
- Two Microphones,
- A video camera,
- A WIFI Antenna,
- Bluetooth,
- An accelerometer,
- A gyroscope &
- A compass [5]

TECHNICAL SPECIFICATIONS AND INTERFACES

Google Glass Technical Specification

Technically, it is a wearable computer which runs on Android 4.x OS without support of cellular network [4]

Table 1: Technical Specification of Google Glass

Sr. No	Specification	Description
1.	Display/Projector	High resolution display which is equivalent to 25 inch high definition screen from eight feet away Video resolution WVGA(800*480 pixel)
2.	Camera Resolution	5 MP (2500*2000 pixel), 720p HD video
3.	Connectivity	WIFI 802.11 b/g, Bluetooth(V.4)
4.	Processor	Dual core TI OMAP 4430(Cortex-A9) frequency 1.2Ghz
5.	ROM(Read Only Memory)	16Gb available to users~12.5Gb
6.	RAM(Random Access Memory)	1Gb available to users~650Mb
7.	Connectivity to PC	Micro USB
8.	Operating System	Android V.4.0.4
9.	Dynamic Speaker	Contact Vibrating dynamic speaker
10.	Microphone	In place
11.	Battery	“One day of typical use” Presumably- 700-800MAh
12.	Detectors	Accelerometers, GPS receiver

Internet connections are possible only via WI-FI technology and it can even get connected to the smart phones simply via Bluetooth.

Google Glass Interaction

On/Off button: To turn the device on/off.

Capture a photo/video: Use the camera button to capture a photo or to record a video. You will be able to see the brief preview of a picture after snapping a picture instantly. By default, it can record a video clip of up to 10secs whereas one can continue the recording or extend it simply by pressing camera button.

Touchpad: Recognizes user's motions. [2] Google Glass Interfaces are shown below in the figure.

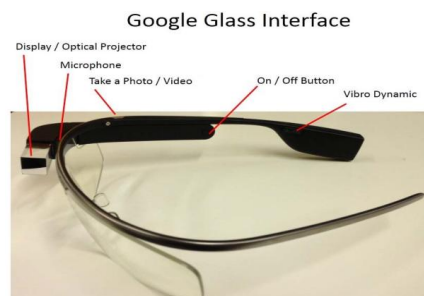


Figure 2: Google Glass Interface

WORKING OF GOOGLE GLASS

What Makes it Work?

Google Glass can access the internet via WIFI & can also communicate with the smart phones via WIF.

It displays the contents (application & software menu) on the video screen & it also responds to the voice commands of the users. The display technology involves a critical functionality of prism that places a layer of picture & reality in front of eyes. One of the best things about Google Glass [7] is that the built in camera does not require a viewfinder- so you can take a picture or video of what you are actually watching currently. Another Innovation offered includes sound with bone induction technology; where the sound is created simply by vibrating your skull.

Voice Commands

Google has developed the voice command technology recently in its mobile O.S. named Android 4.1 version [6] The users have to use Google data words which create appropriate commands. Currently, only English is being used for communicational purpose but later on it will support many other languages.

Setting up Google Glass

By using the power button located on the inner side of the glass one can turn on/off the device .When user turn the button on, Glass become active. After a default period of time when the user is not interacting with the glass, the display will get turn off immediately. Users can turn on the device by tapping on right side of the device or by tilting his head up. One can set glass to go into a sleep mode whenever he takes it off (On Head Detection).

TECHNOLOGY

Wearable Computing

These are nothing but the electronic devices that are worn by the bearer under, with or on top of clothing. It has been developed for general or special purpose I.T usage and media development. So Wearable computers [4] combines applications which require more complex computational support than just hardware coded logics. In wearable computing there is a constant interaction between user& computer so there is no need to turn the device on/off this feature is called as Consistency. It also supports multitasking i.e. they are able to perform many functions at the same time.

Ambient Intelligence

The electronic environment that is sensitive & responsiveness to the presence of users are known as ambient intelligence where the devices work in a manner that allows the user to perform their daily activities.

Smart Clothing

This technology combines Signal transferring & digital device technology together & uses it in the clothing and includes combined features of Optical fibre [5] technology and digital technology.

Eye Tap Technology

It's a device that are worn in front of the user eyes which can be used as a camera as well as it can also act as a display to superimpose a computer generated image on the eyes. So, by having this device on eyes; user's eye can operate as both monitor and a camera.

4G Technology

The inter and intra connectivity's are established via the usage of 4G [6] technology that provides internet access in terms of mobile ultra broad band

Android OS

Android was originally developed by Google in conjunction with open handset alliance to support mobile device such as Smart phones & tablets. It's a Linux based Operating system.[7]

Applications and Uses

The glass usage offers numerous benefits to the varying human societies which includes disabled ones who miss the current technologies usage. The various usages in daily life are listed as below:

- One can make a call via Google Glass.
- A user can take pictures and record videos simply hands free.
- It can give directions to guide in front of the eyes by using Google maps.
- It can act as a translator at times.
- It is flexible (strong & light) for everyday use.
- It helps in searching the web content online at anytime.
- It can let you know how fast you are driving.
- It permits the user to send/receive the message/emails. [4]
- Google Glass allow the user to make a video calls.

MERITS AND DEMERITS

Advantages

The numerous benefits offered from the glass are listed below:

- Easy to use & wear.
- Responsive & sensitive to the presence of people.
- Allow easy & quick access to internet, map, videos, docs etc.
- A spectacle [6] based computer to reside directly on your eyes rather than pouch or user's pocket.
- A powerful technique for all kinds of handicapped & disabled [7]

Disadvantages

The limitations associated with the glass usage are mentioned below:

- Can get easily damaged if proper care not taken.
- It may result in breaching of people's privacy.
- Regular pop up ads & notifications [4] may drop down its speed.

- It may cause some serious damage to eyes if constantly wearied.
- Cost is high.

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